Meridional Flow in Solar Cycle 24: The Impact on the Polar Magnetic Fields

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Axisymmetric flows, Differential Rotation and Meridional Flow (MF), were measured by tracking the motion of magnetic elements on the surface of the Sun using data obtained by the Helioseismic and Magnetic Imager (HMI) on the NASA Solar Dynamics Observatory (SDO) Mission. HMI provides the highest resolution full-disk magnetograms available to date. This dramatically reduces the noise in axisymmetric flows, particularly at high latitudes (i.e. near the poles). The MF was found to vary greatly from one Carrington Rotation to the next. Furthermore, a distinct north-south difference was found in the MF at high latitudes: Flow in the South was persistently weaker than flow in the North. Conclusions will be drawn concerning the MF variability, north-south differences, and the impact on the polar magnetic field strengths and the timing of their reversals.